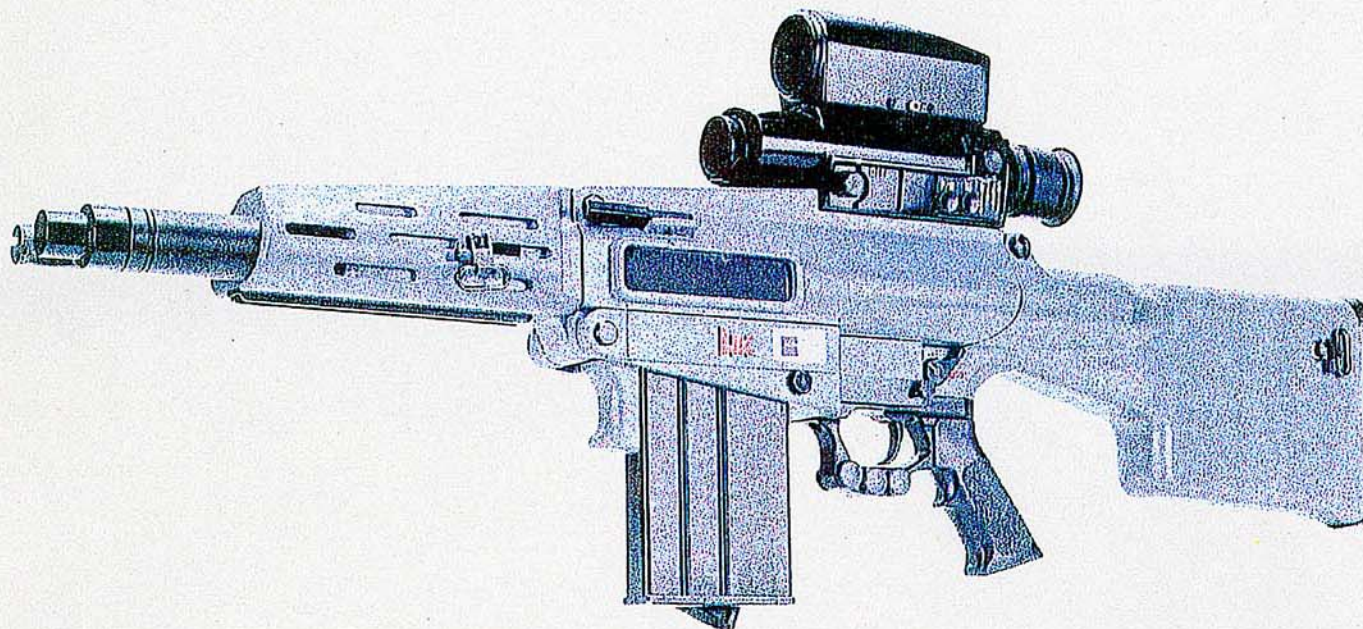




OICW Overview

5 January 1996



17268_3

Contraves—Heckler & Koch—Dynamit Nobel

Alliant Techsystems Competition Restricted



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saW

ORIGINAL PROPERTY OF
ROYAL ARMOURIES
 **LEEDS**



WSSC Agenda

0800 - 0805	Introductions, Membership, and Agenda Review	Mike Moore
0805 - 0815	WSSC Objective and Charter	Jed Holzapfel
0815 - 0830	Program Summary	Mike Moore
	OICW Customer	
	OICW Requirement	
	Baseline	
	What Does Customer Want	
0830 - 0850	Competition	Tom Bierman
0850 - 0930	Win Strategy	Tom Bierman
0930 - 0945	Issues	Tom Bierman/Mike Moore
0945 - 1000	Discussion	All
1000 - 1015	WSSC Caucus	WSSC
1015 - 1030	Debrief and Action Items	Jed Holzapfel



Program Summary

17268_4

Contraves—Heckler & Koch—Dynamit Nobel

Alliant Techsystems Proprietary



Executive Summary

OICW Objectives



Program Objectives

Develop and field an ergonomically designed, multifunctional combat weapon system that has...

- High-explosive, air-bursting munition (20mm)
- Kinetic energy projectile (5.56mm)
- Compact modular fire control
- Full use to 1000 meters

that is capable of...

- Affecting decisively violent and suppressive target effects
- Incapacitating targets in all operational scenarios, including defilade
- Linking to GEN II soldier

ATD Objective

Determine operational utility and technical maturity of OICW

Executive Summary

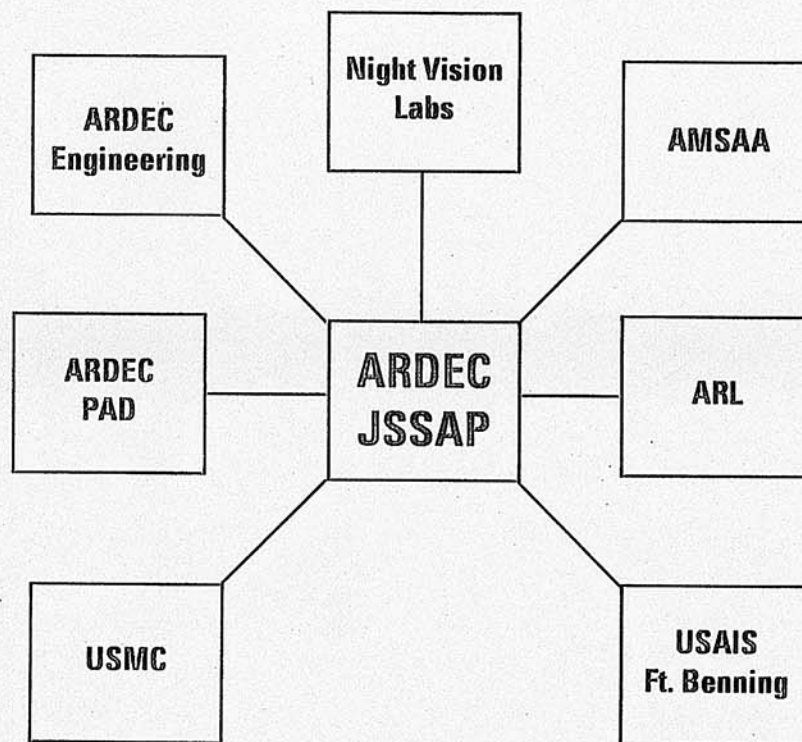
Program Military Significance



- Has the potential for selective replacement of four weapon systems (M16, M203, M249, M4)
- Quantum improvement in the combined lethality of the replaced weapon systems (5 percent versus 50 percent at 300 meters for KE ammunition)
- Defeats targets the M16 rifle cannot (e.g., defilade targets)
- Increases operational awareness, versatility, and survivability
- Provides superior standoff and operational capability (300m versus 1000m)
- Results in decisively violent and suppressive enemy target effects

Executive Summary

OICW Customer Organization



17268_7

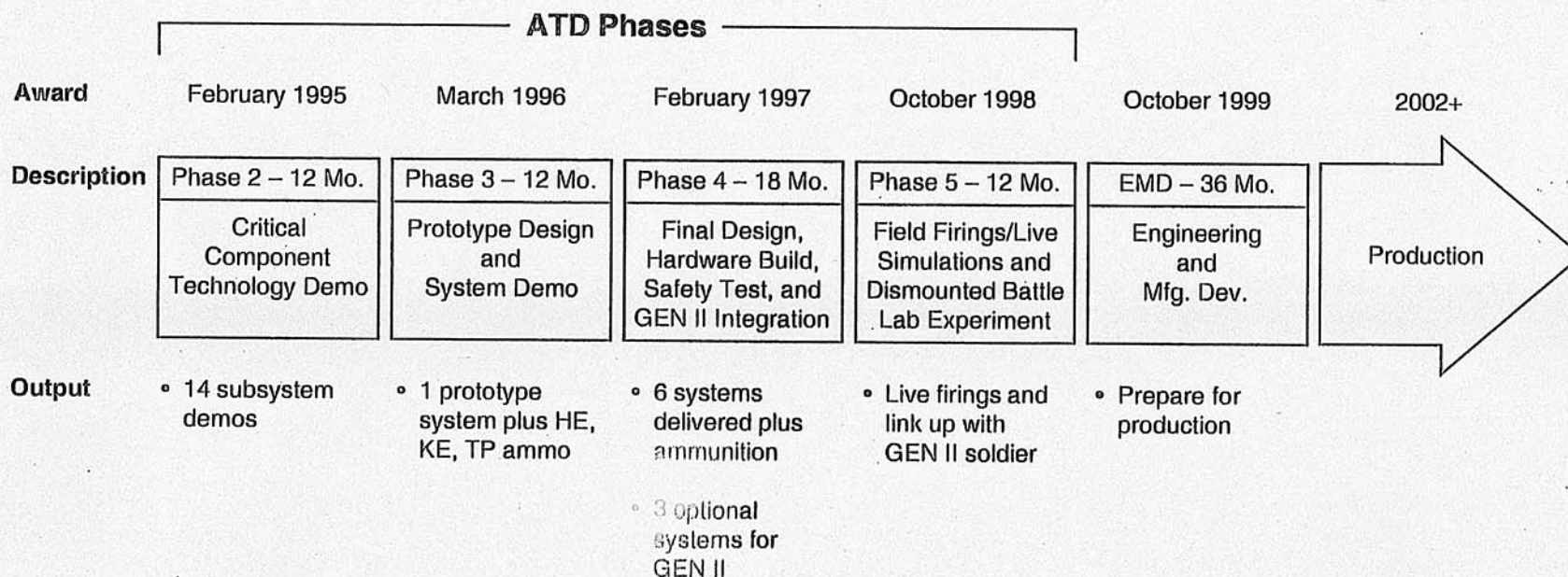
Contraves—Heckler & Koch—Dynamit Nobel

Alliant Techsystems Proprietary



Executive Summary

Program Planning Schedule



ATD approved Dec. 1994 — George Singley's Office—SARDA

Executive Summary

The OICW Vision...Soldier Benefits and Performance Assessment



Requirements (ATD Exit Criteria)	OICW Benefit vs M16/203/TWS	ATD (Threshold)
Probability of incapacitation	Greater than 5X advantage Defeat of defilade/protected targets to 1000m	Green
Transmit time of flight data to fuze	Semi-automatic capability maintained	Green
Probability of suppression	2.5X range advantage	Green
Firepower/load	Six rounds (HE), 30 rounds (KE) substantially increases soldier survivability	Green
Weight	50+ percent savings in weight	Green
Gen II interface	Integrated system provides link to Gen II	Green
Cost projections	\$10K for system cost compared to \$25K+ for M16/203/TWS. Ammo (HE) cost projected at <\$25.	Green

All ATD exit criteria will be met or exceeded

17268_9

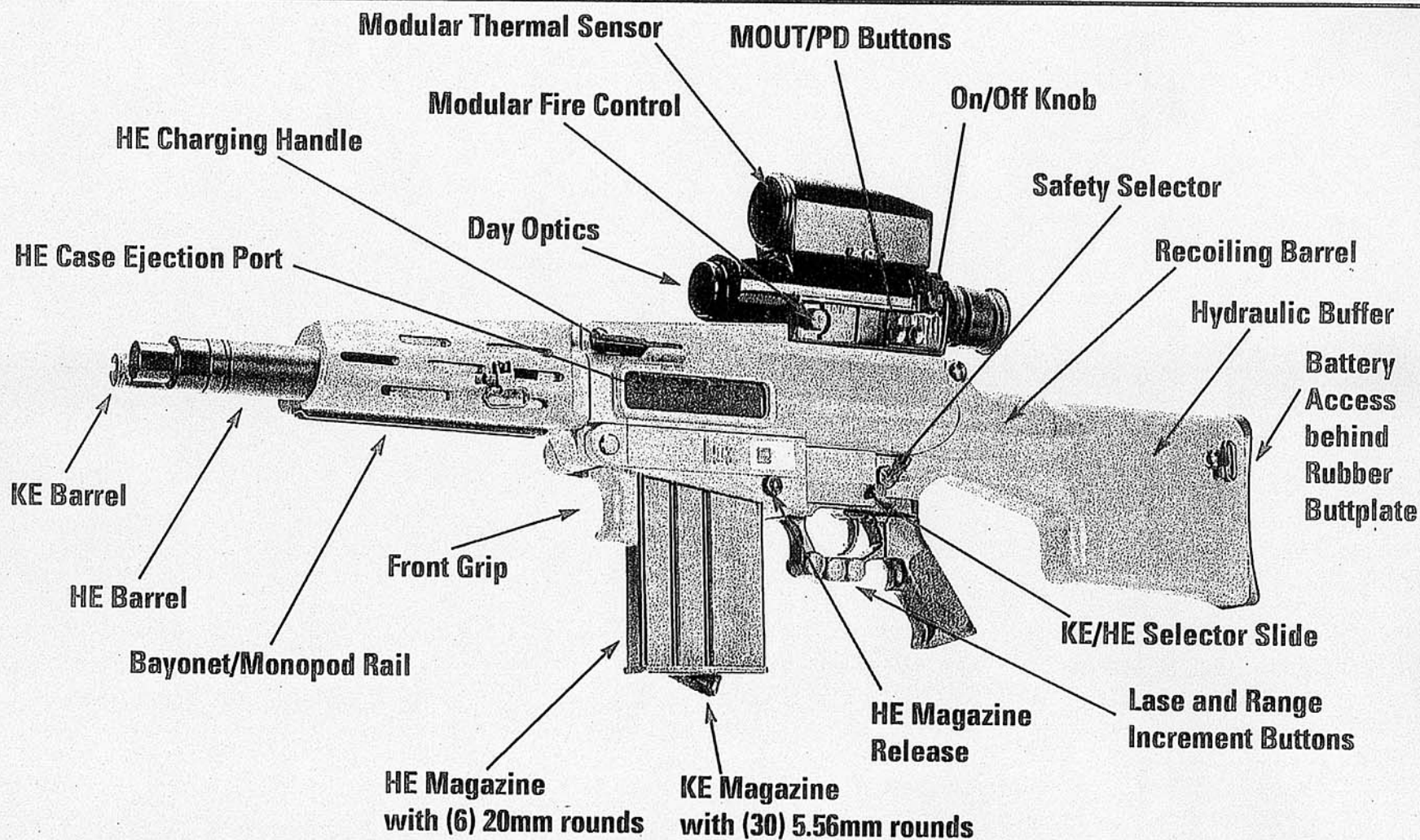
Contraves—Heckler & Koch—Dynamit Nobel

Alliant Techsystems Competition Restricted



Executive Summary

System Description



17268_10

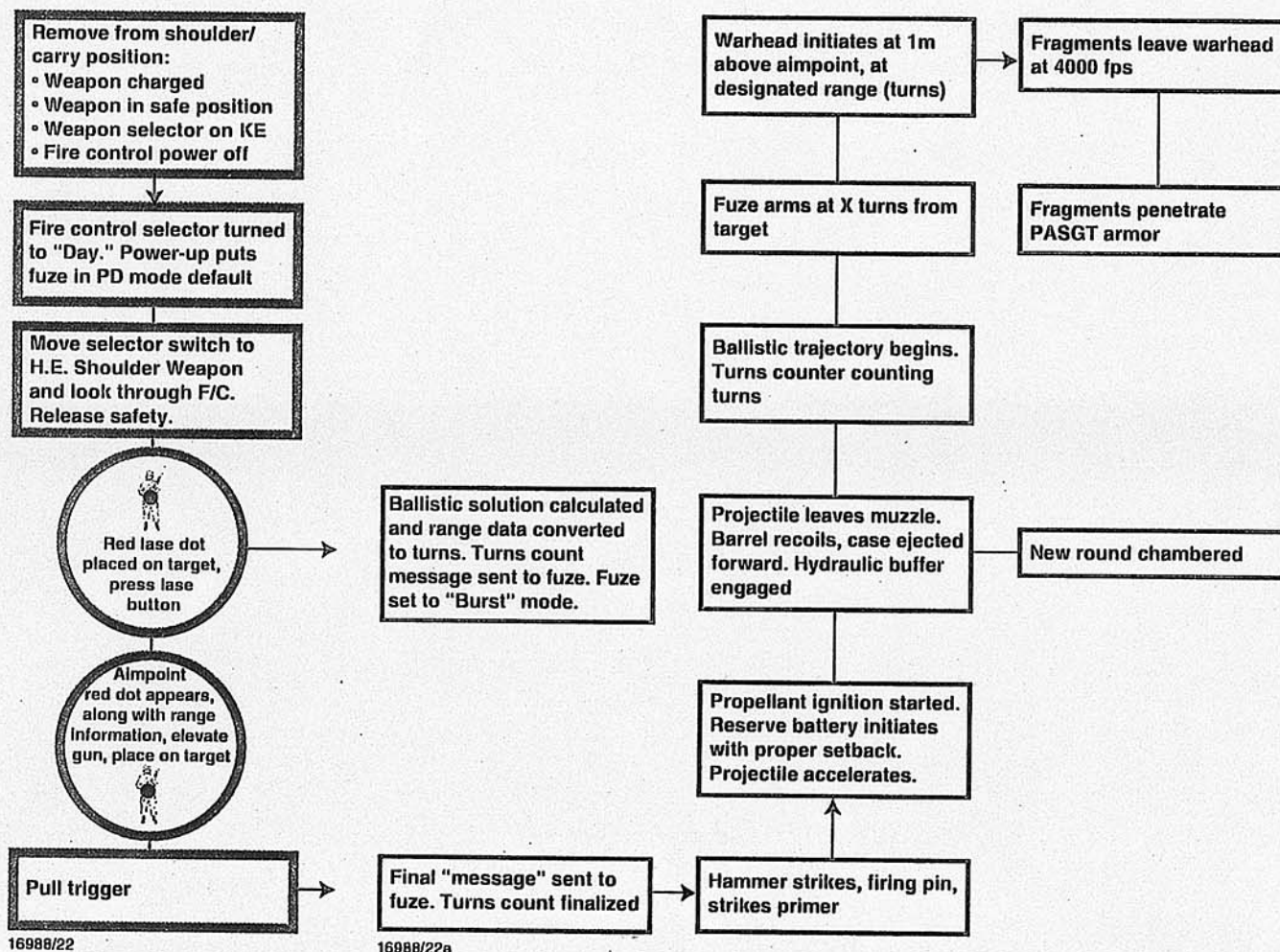
Contraves—Heckler & Koch—Dynamit Nobel

Alliant Techsystems Competition Restricted



Executive Summary

Operational Functional Block Diagram (One Scenario)



17268_11

Contraves—Heckler & Koch—Dynamit Nobel

Alliant Techsystems Competition Restricted



Executive Summary

OICW Weapon System Features and Advantages



Tactical weight is 11.9 lbs

Fire control provides video/data interface for Gen II soldier

Simple, reliable fixed fire control (red dot aim-point) allows full use to 1000m. Low cost, modular uncooled thermal sight provides day-night capability

Proven floating barrel with hydraulic buffer effectively mitigates recoil and allows use of high velocity/flat ballistic trajectory ammunition

Side-by-side configuration produces low profile, mechanically simple, and high field reliability

5.56 KE ammunition and magazine common with M16

Off-the-shelf military battery housed in buttstock

Turns count fuze provides muzzle velocity compensation for precision fire signal on target

20mm controlled fragmentation bursting munition with delay, point impact, and self-destruct features provides the soldier with five times more effectiveness than M203 at greater than twice the range

User-friendly switches and switch locations, designed with significant user input

Unique features designed to meet ATD exit criteria

17268_12

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Alliant Techsystems Competition Restricted



Executive Summary

Integration of Seven Key Phase 2 Technologies to Assure Phase 3 Success



Element

Weapon

- Recoil mitigation

Approach

- Demonstrated floating barrel/hydraulic buffer on USMC Close Assault Weapon (CAW), OICW Government team fired CAW at PR2 (September 1995)
- Demonstration of OICW design planned for January 1996

Ammunition

- Ballistics

- Propulsion validated in tests (1995)
- Dispersion exit criteria demonstrated (1995)

- Accurate miniaturized fuzing

- 3-D computer design shows size very achievable; many components fabricated
- Demonstrated turns counting approach in ballistic tests in 1994
- S&A, inductive set demonstrated in LAB-1994
- Demonstrate 20mm turns counting fuze – January 1996

- Warhead lethality

- Controlled fragmentation demonstrated in 1994
- Tests of both conventional and innovative designs beginning in October/November

Assured low-risk OICW approach through proven, tested technologies and planned demonstrations



Executive Summary

Seven Key Technologies (Continued)

Fire Control

- Integration
 - Simple, full use approach to 1000m
 - Leveraging ISM laser development
 - Plan to demonstrate novel, semiconductor laser approach December 1995
 - Demonstrate Uncooled Infrared (UIR) – February 1996
 - Accurate laser ranging (± 1 m) demonstrated

System

- Human factors
 - Four generations of models built for user assessment
 - Design flexibility maintained to allow continued evolution of weapon implementation
- Weight reduction
 - Extensive use of plastics
 - HK is developer of lightest assault weapon fielded (HK 50)
 - Weight reduction road map shows path to 11.9 lbs
 - (3) titanium HE barrels have been produced for testing

Assured low-risk OICW approach through proven, tested technologies and planned demonstrations



Competitive Assessment

17268_15

Contraves—Heckler & Koch—Dynamit Nobel

Alliant Techsystems Proprietary



Assessment Objectives

- Objective:**
- Assess competitive position of Alliant Techsystems OICW team and system design relative to the AAI team and design
 - Understand JSSAP and OSD acquisition strategy and potential alternatives – advocate approach supporting Alliant Techsystems team strategy
 - Establish strategies/action to ensure continued participation in Phase III, Phase IV, EMD, and Production Transition



ARDEC

1995 ADPA SMALL ARMS SYMPOSIUM

*Ft. Drum - Alexandria Bay, NY
27 June 1995*



**OBJECTIVE INDIVIDUAL
COMBAT WEAPON
(OICW)**

Presented By:

STEPHEN M. MANGO
(201) 724-7944

U.S. ARMY ARMAMENT RESEARCH,
DEVELOPMENT AND ENGINEERING CENTER (ARDEC)
ATTN: AMSTA-AR-CCJ
PICATINNY ARSENAL, NEW JERSEY 07806-5000
U.S.A.

JSSAP

ADPA.CH3
27 JUN 95



BASIC CONTRACT STRATEGY



- **Phase I: Systems Analysis and Conceptualization**
 - ✓ **31 May 94 - 15 December 94**
 - ✓ **3 Competing Contractor Teams (\$340K-\$469K)**
 - **AAI Corporation, Hunt Valley, MD**
 - **Alliant Techsystems, Hopkins, MN**
 - **Olin Ordnance, Downey, CA**
 - ✓ **Contract Down Selection Process**
- **Phase II: Critical Sub-System Component Design & Demo**
 - ✓ **13 Feb 95 - 12 February 96**
 - ✓ **2 Competing Contractor Teams Continue (\$3.3M-\$3.6M)**
 - **AAI Corporation**
 - **Alliant Techsystems**
 - ✓ **Down Select To 1 Contracting Team**
- **Phase III: Prototype System Design & Demo**
 - ✓ **1 April 96 - 31 Mar 97**



PHASE I TRADE-OFFS



AMMUNITION:

KE Caliber (4.6, 4.92, 5.56, 5.7, 9mm)
HE Caliber (19, 20, 22, 25, 30mm)
Cartridge Case (brass, aluminum, plastic,
caseless, combustible)
HE Warhead (steel, tungsten, other)
Fragmentation (1-6 grain)
HE Muzzle Impulse (3-6 lb.sec.)
Size/Weight/Cost/Producibility

FUZE:

Air Burst Capability (electronic time, turns
counting)
Location (nose, mid, base)
Setting (inductive, direct contact)
Power (capacitor, battery, combination)
S&A (mechanical, electro-mechanical,
electronic)
Size/Weight/Cost/Producibility

**OICW
SYSTEM
CONCEPTS**

FIRE CONTROL:

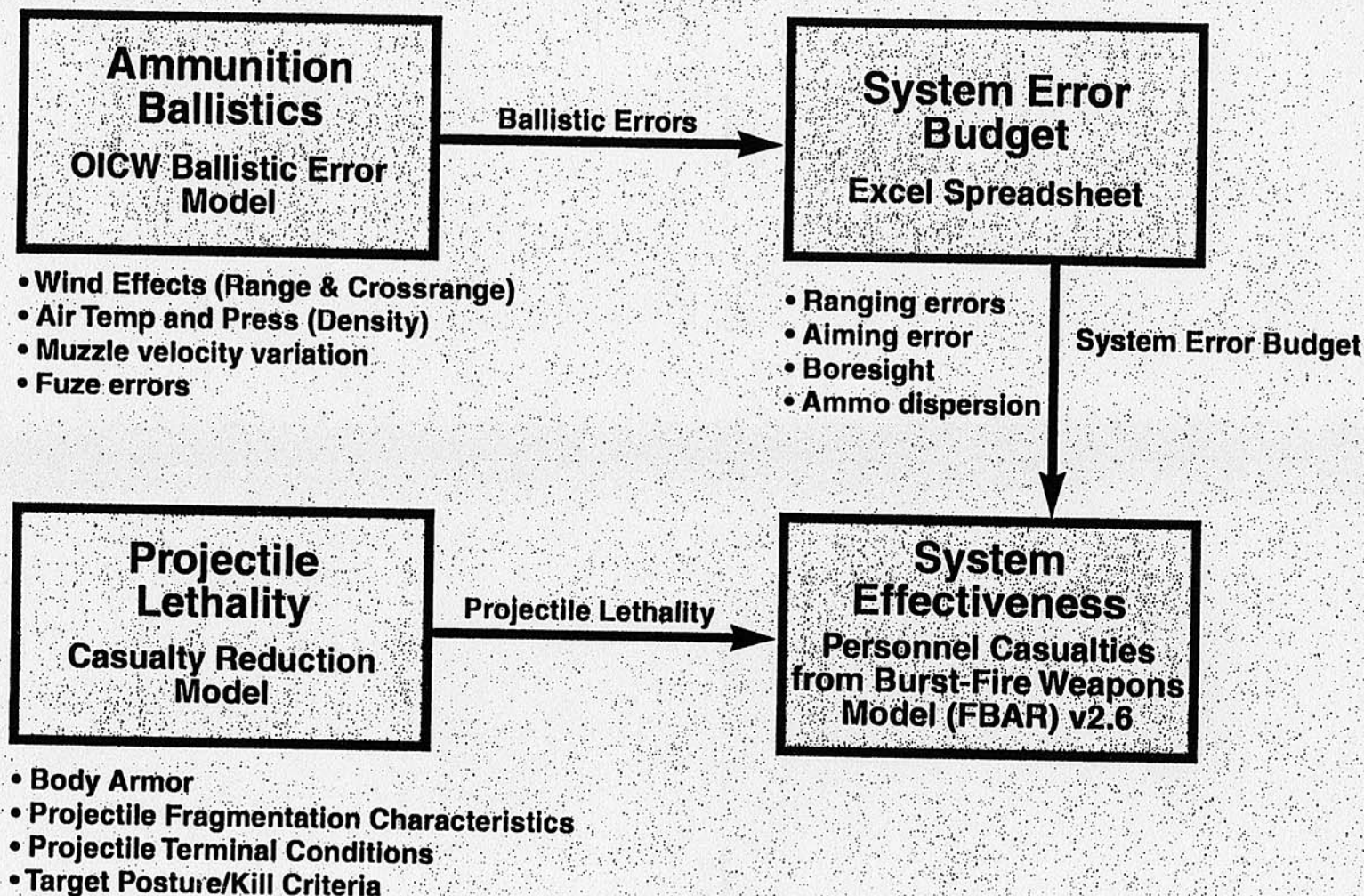
Vision Systems (DVO, FLIR, CCD,
back-up iron)
Field of View (6-12deg)
Magnification (1x-4x)
Electronics, Sensors & Power Supply
Modularity/Packaging
Laser Ranging
GEN II Soldier Interface
Size/Weight/Cost/Producibility

WEAPON:

Integration (over/under, side-by-side,
bull-pup)
Recoil Mitigation (internal, external,
combination)
Composite Materials
Ergonomics
Size/Weight/Cost/Producibility

System Tradeoff Process

OICW





OICW
Leap Ahead
Solution

SYSTEM MUST ADDRESS ALL TARGET SCENARIOS



**EXPOSED
STATIONARY**



PROTECTED

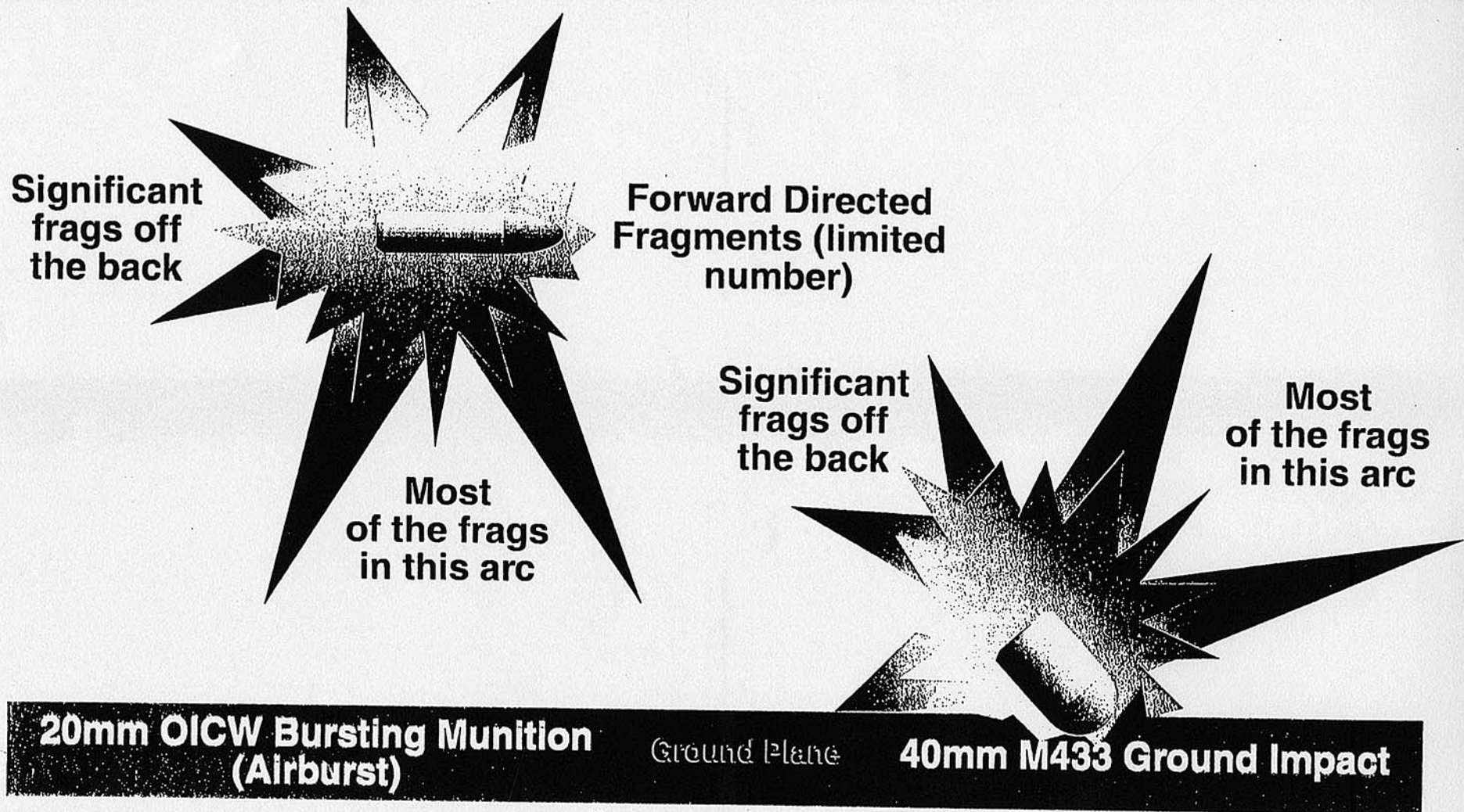


**FLEETING TO
CONCEALED**

INCREASING DIFFICULTY

27 JUNE 1995

Bursting Munition (Airburst) vs Impact Fragmentation *OICW*





OICW
Leap Ahead
Solution

FIRE CONTROL VS. WARHEAD TRADEOFFS

Range Error Is Predominant Error Source
Affecting Lethality

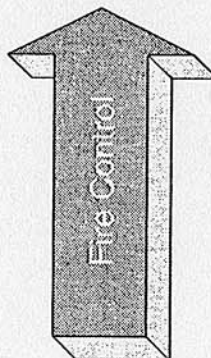
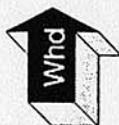
Solutions

Warhead Enhancements

- Proportionally less lethality gain
- Increases weapon wt
- Increases recoil impulse
- Reduces effective range
- Reduces velocity
- Increases ammunition costs

FCS Error Reduction Enhancements

- Addresses difficult scenarios
- Allows optimization of weapon wt
- Provides minimum recoil impulse
- Increases effective range
- Minimizes expendable cost



Relative Benefit of
Range Error Solution

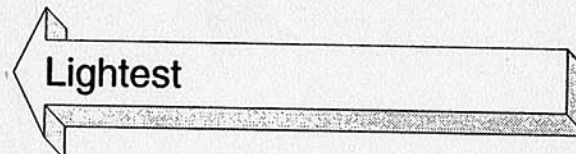
27 JUNE 1995



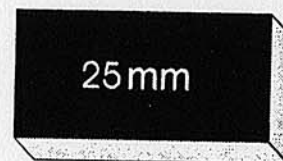
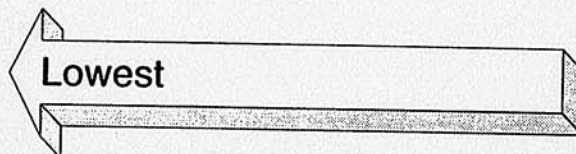
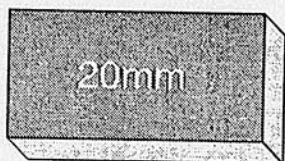
OICW
Leap Ahead
Solution

PROJECTILE CALIBER TRADEOFFS

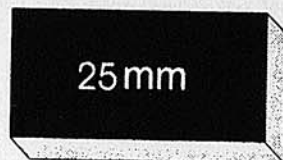
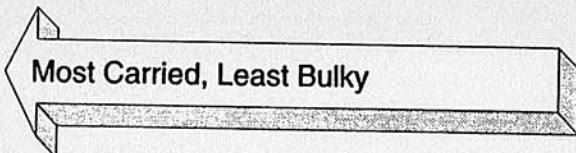
Weapon Weight



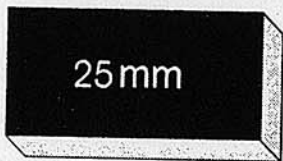
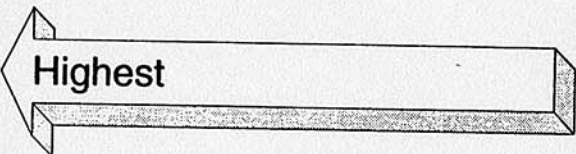
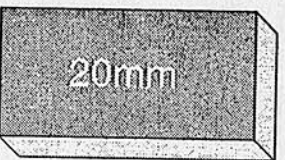
Recoil Impulse



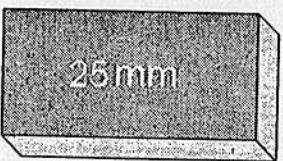
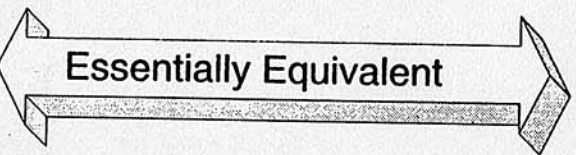
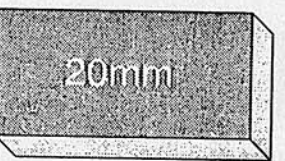
Ammunition Weight



Muzzle Velocity



Lethality



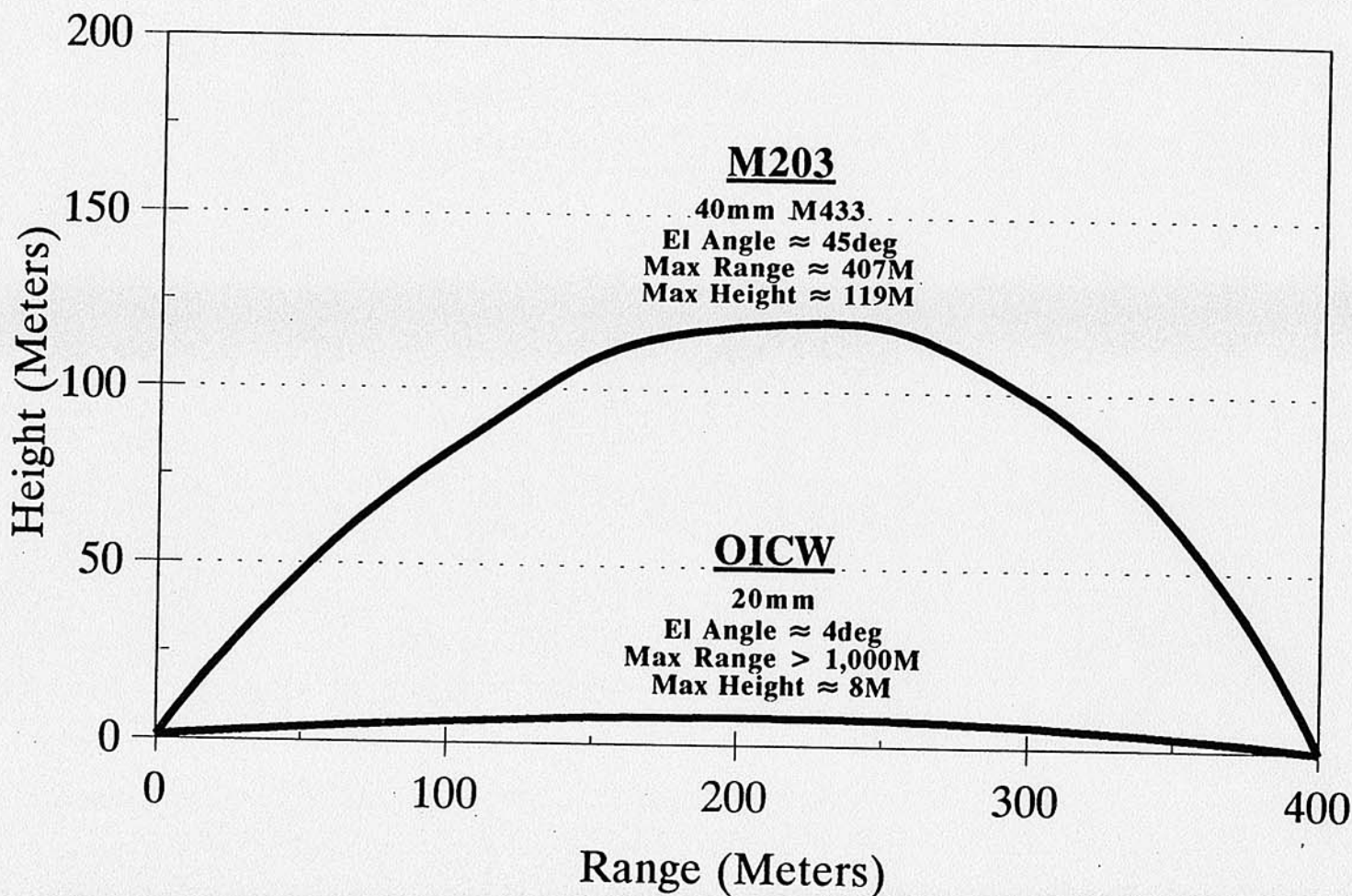
27 JUNE 1995



TRAJECTORY COMPARISON

20mm OICW vs. 40mm M433

0 - 400 Meters

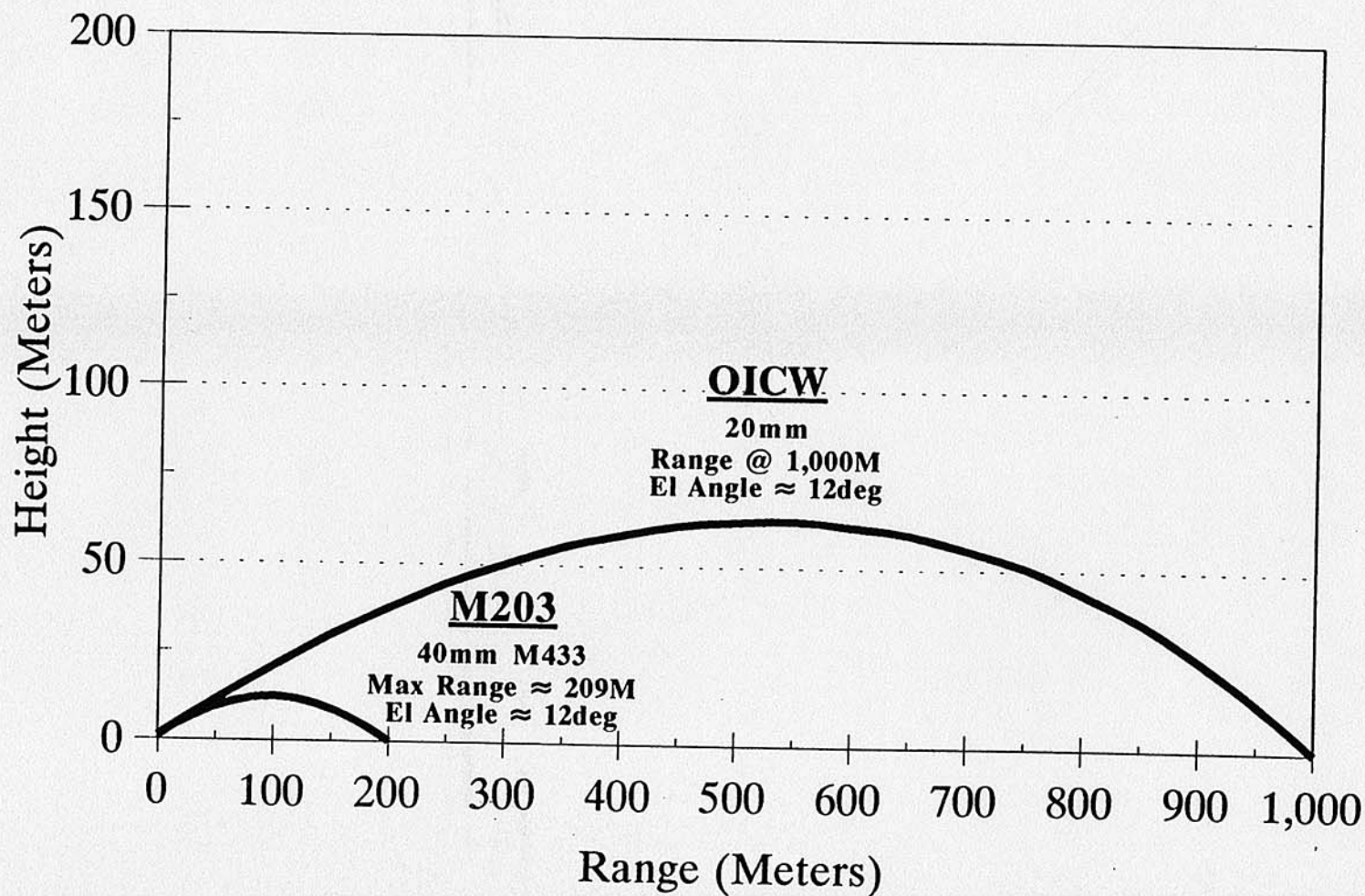




TRAJECTORY COMPARISON

20mm OICW vs. 40mm M433

0 - 1,000 Meters





OICW
Leap Ahead
Solution

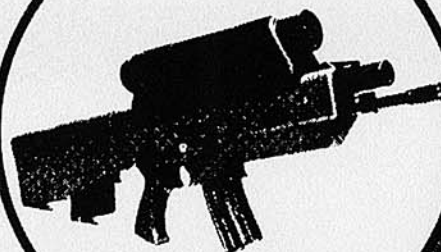
AAI OICW DEVELOPMENT TEAM "On Target for the Leap Ahead Solution"



PRIME CONTRACTOR & SYSTEM INTEGRATOR

Weapon

Ammunition



HUGHES

Fire Control Subsystem

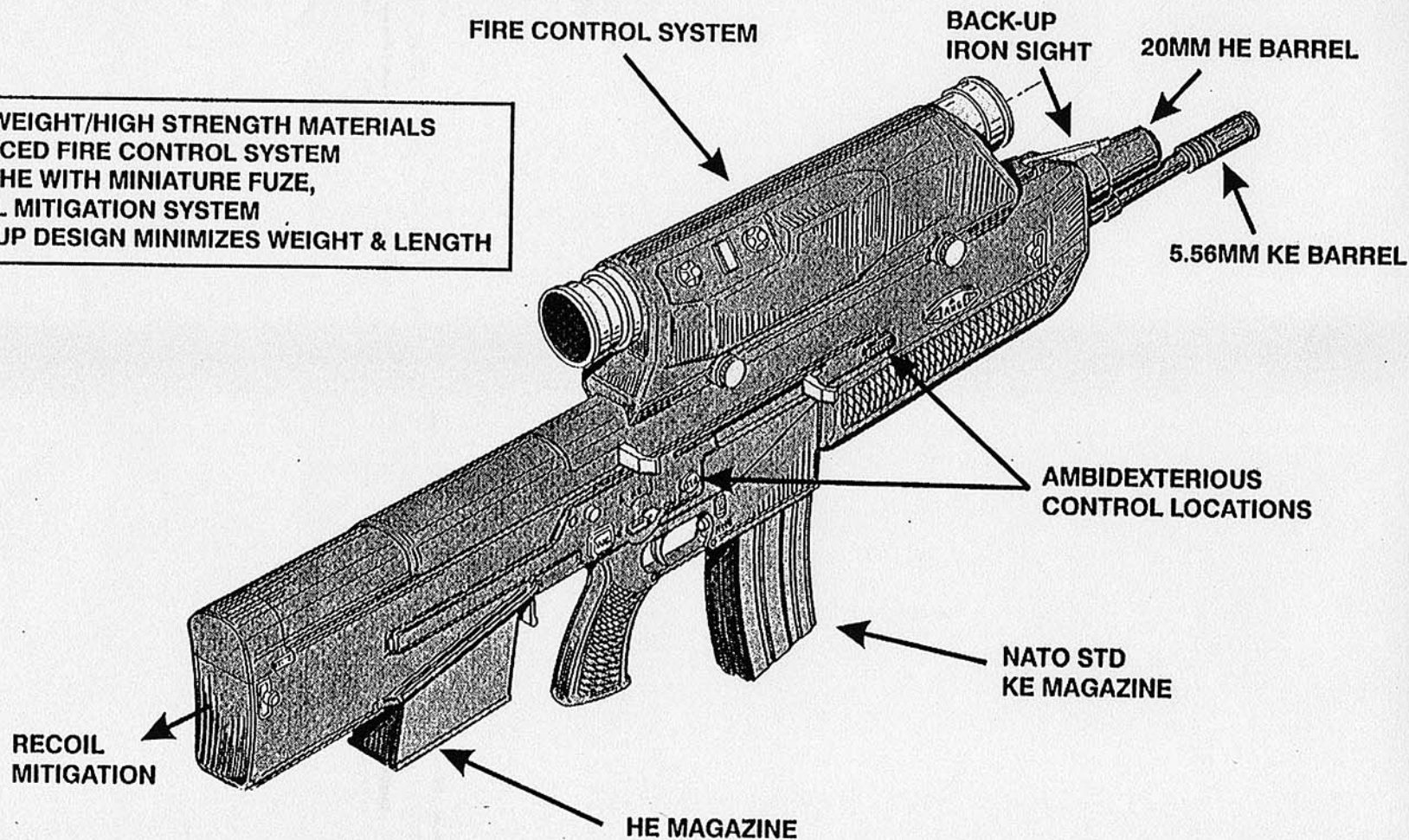




OICW
Leap Ahead
Solution

WEAPON DESIGN & FEATURES

- LIGHTWEIGHT/HIGH STRENGTH MATERIALS
- ADVANCED FIRE CONTROL SYSTEM
- 20 MM HE WITH MINIATURE FUZE,
- RECOIL MITIGATION SYSTEM
- BULLPUP DESIGN MINIMIZES WEIGHT & LENGTH



27 JUNE 1995

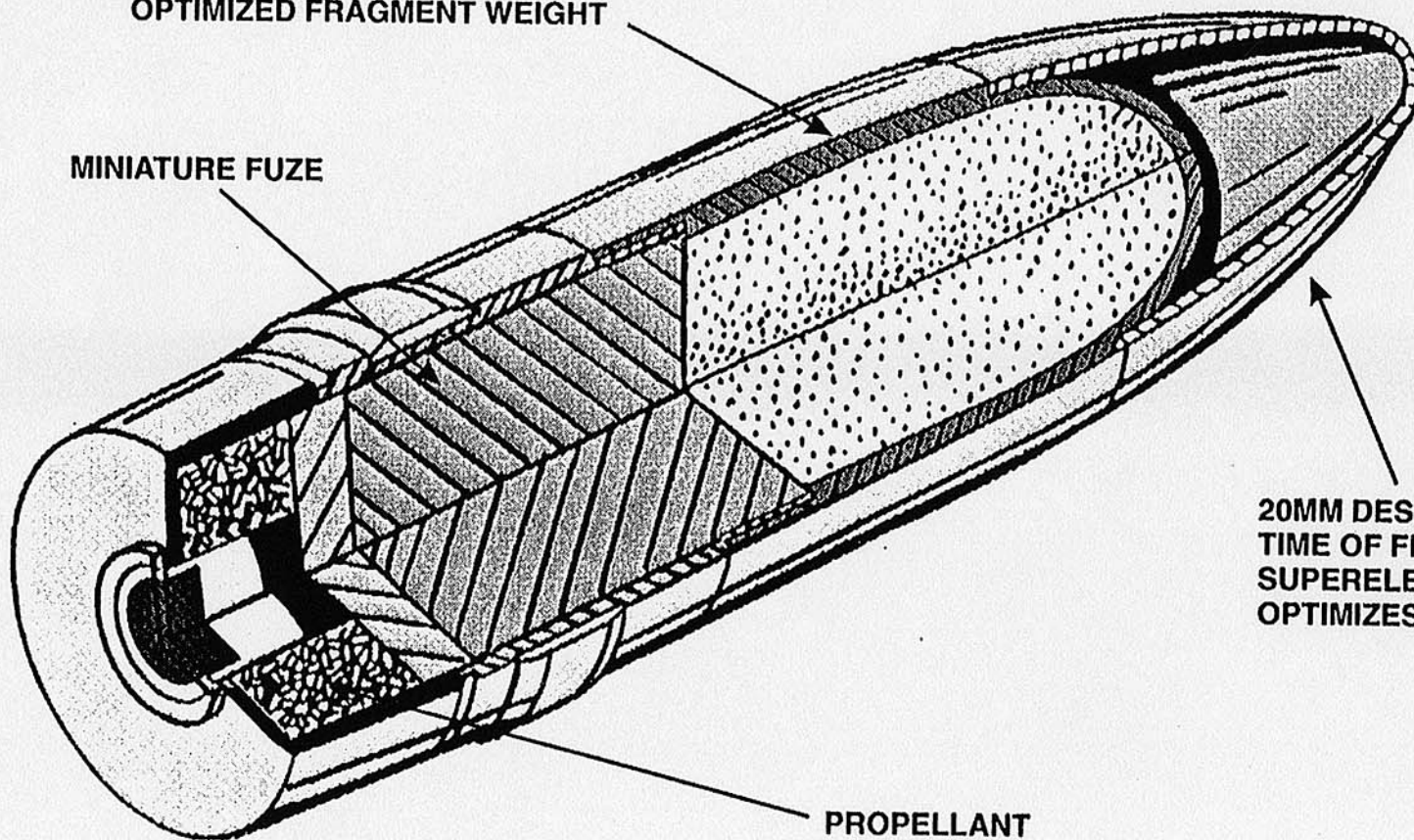


OICW
Leap Ahead
Solution

20MM BURSTING MUNITION

WARHEAD - CONTROLLED FRAGMENTATION,
OPTIMIZED FRAGMENT WEIGHT

MINIATURE FUZE



20MM DESIGN REDUCES
TIME OF FLIGHT AND
SUPERELEVATION,
OPTIMIZES Ph per Lb

PROPELLANT

Alliant Techsystems OICW Team



- System Prime
- Integration
- Ammunition and Fuzing
- Uncooled IR

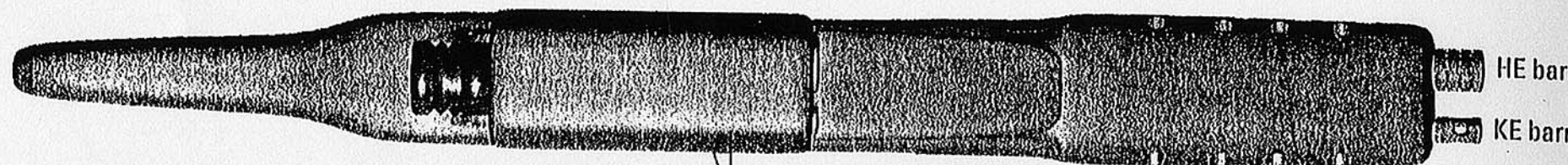


- Gun Development and Testing
- Production Readiness

- Fire Control

- Advanced Propulsion

Tactical OICW Concept



HE bar

KE bar

Buttstock houses
battery, electronics
and recoil mitigation

Modular Fire Control with laser range finder,
ballistic computer, optics
Mission specific modulos available including
uncooled IR.

Switches on both
sides of gun for
left/right gunners

KE ejection port

Rubber
buttplate for
recoil
mitigation

30 round
magazine with
5.56mm ammo

6 round magazine with
20mm high explosive (HE)
bursting munitions

AMMUNITION TECHSYS

HK

15647-01

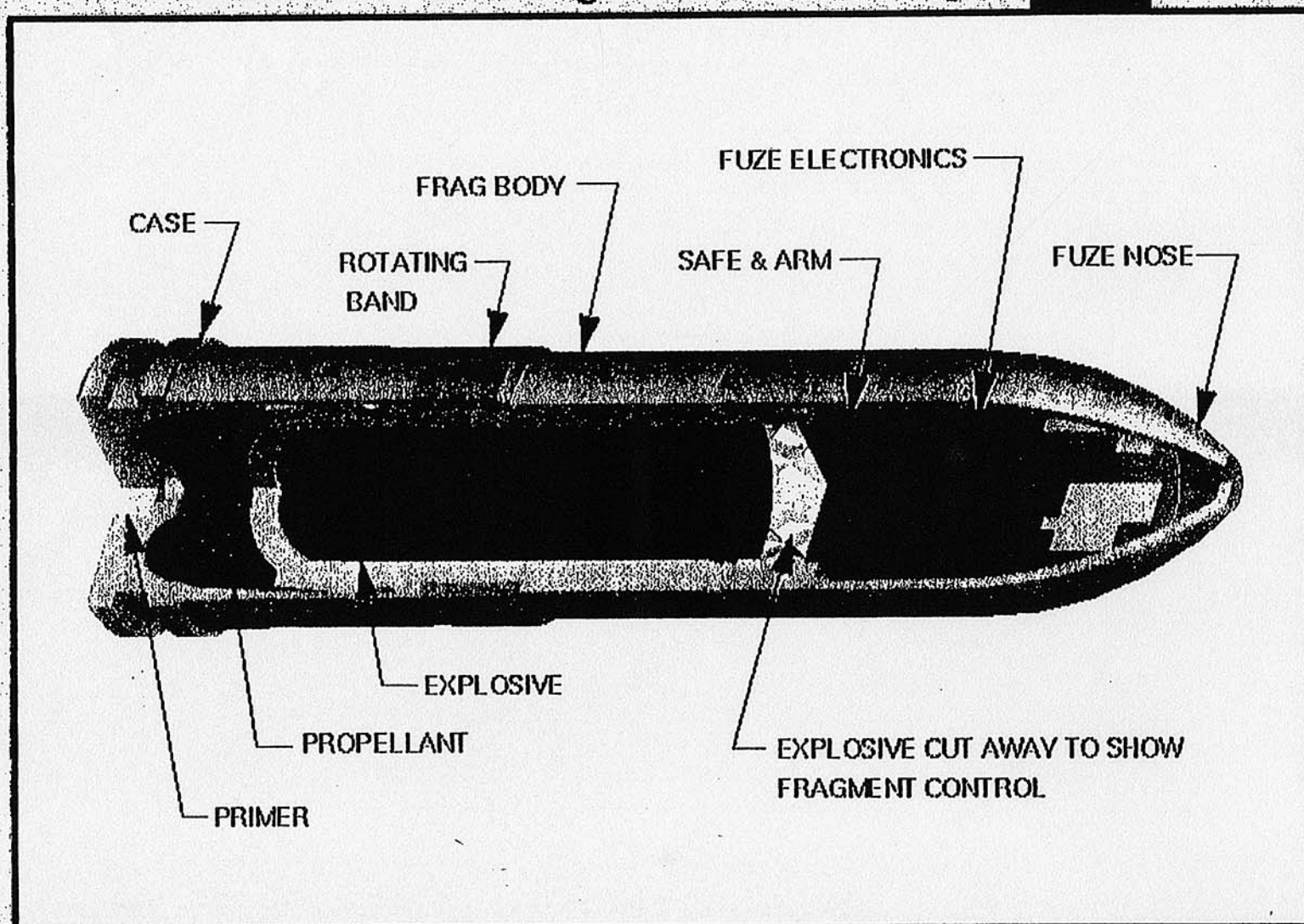
COMBAT

MANUFACTURED BY

OICW

20mm OICW Bursting Munition Cartridge

ALLIANTTECHSYSTEMS

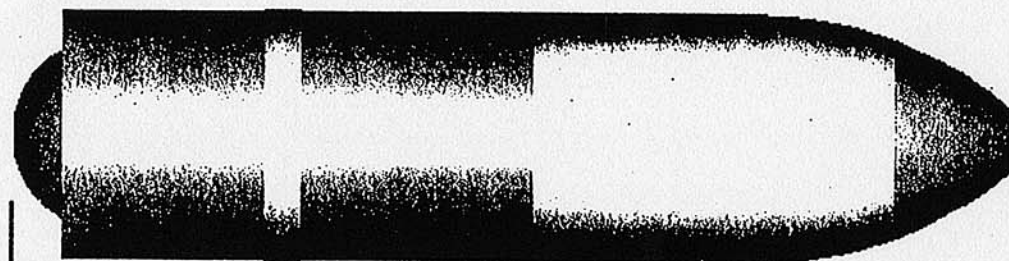


June 8, 1995

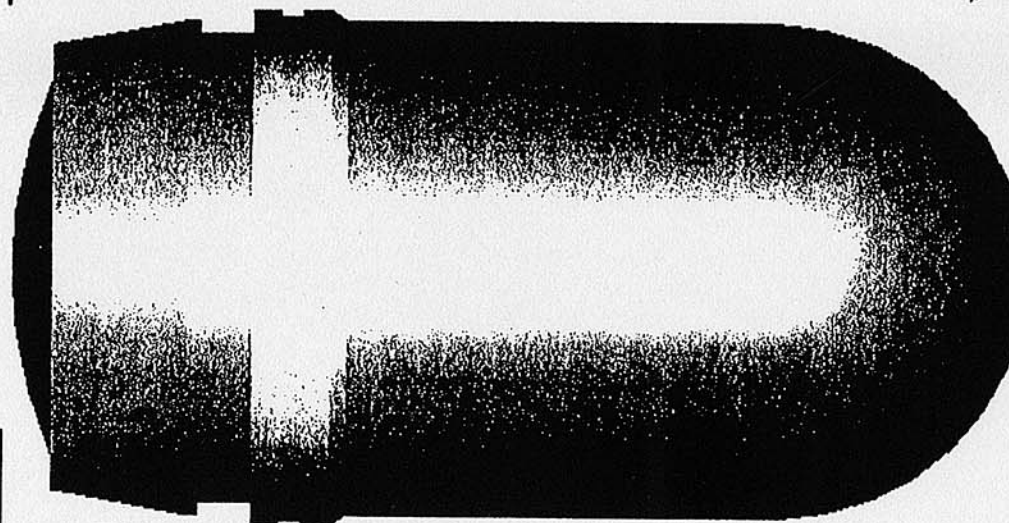
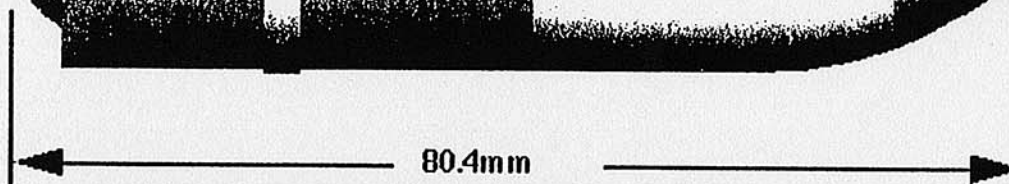
OICW

M433/OICW Projectile Envelope Comparison

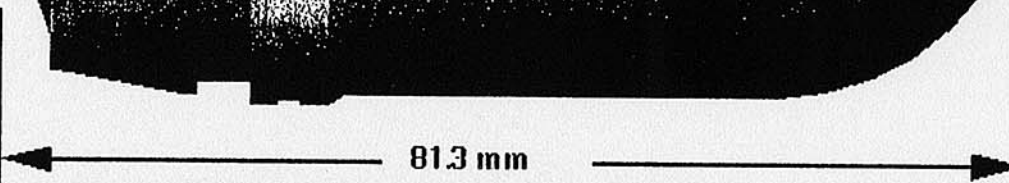
ALLIANTTECHSYSTEMS



20mm OICW HE
Projectile

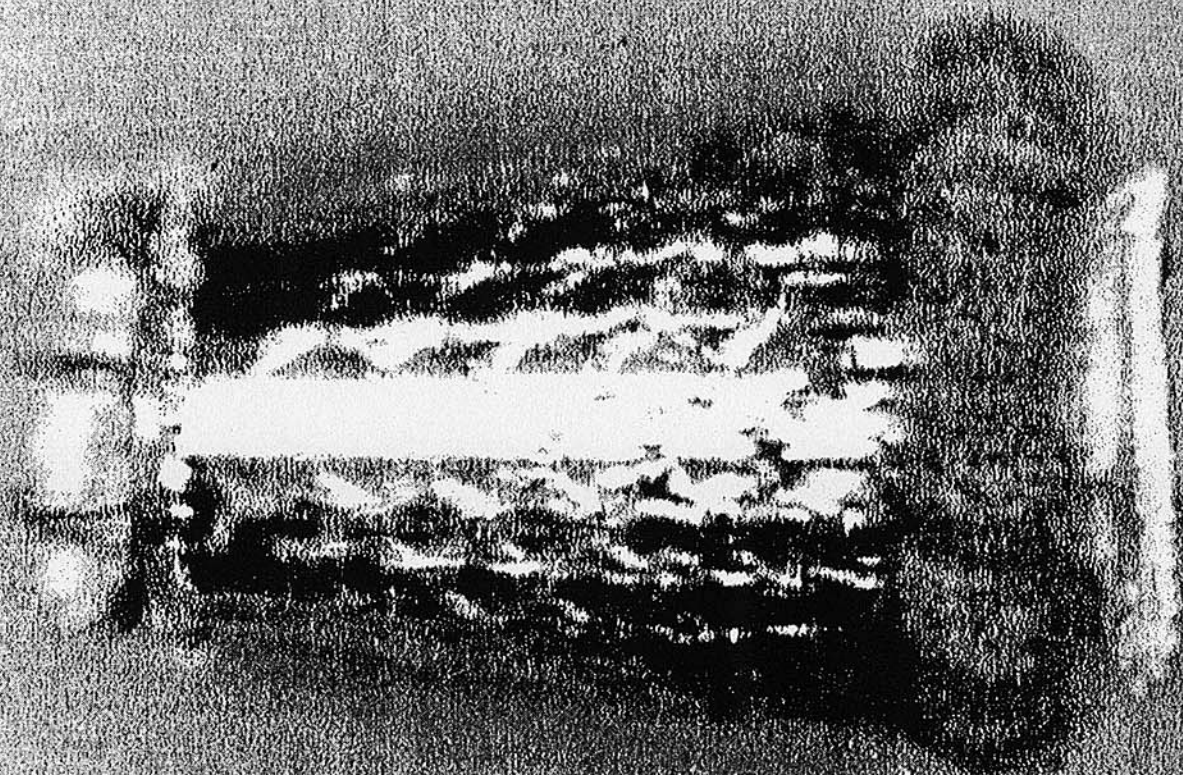


40mm M433 HEDP
Projectile



OICW

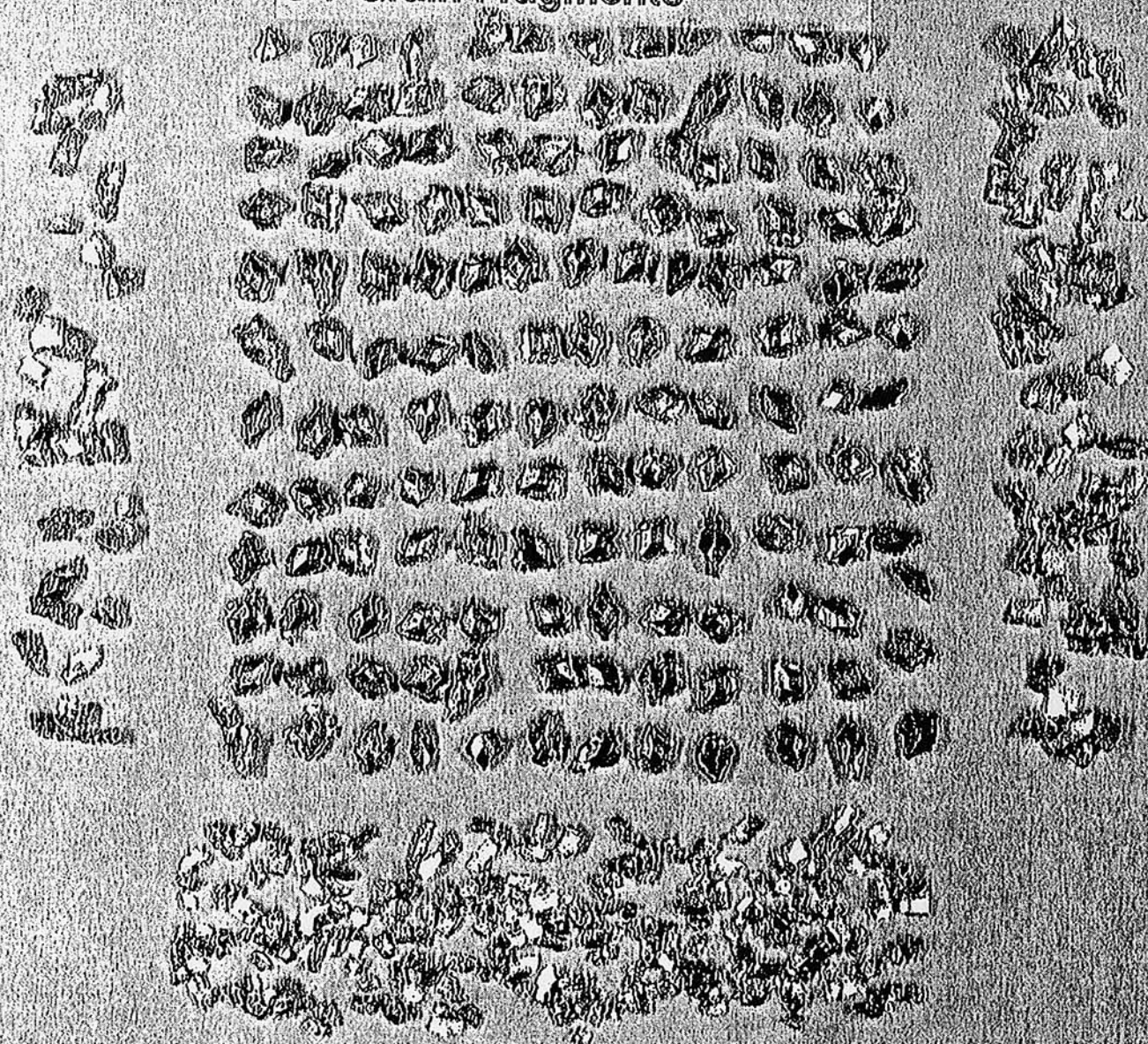
Shear Control Fragmentation



ALLIANT BULLETS

Shear Control Fragmentation 5-7 Grain Fragments

OICW





PHASE II CRITICAL COMPONENT TECHNOLOGY DEMONSTRATIONS



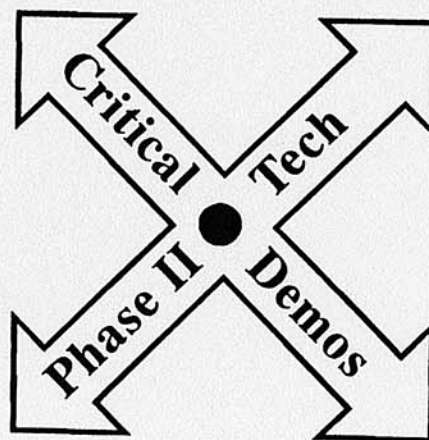
(EXAMPLES)

AMMUNITION:

Internal/External Ballistics
Fragmentation Arena Tests

FUZE:

Fuze Set Demo
S&A Demo
Fuze Power Supply
20mm Fuze Packaging
Fuze Accuracy



FIRE CONTROL:

Laser Range Finder
Fire Control Interface
Fuze Set Demo

WEAPON:

Recoil Mitigation
Fuze Set Demo



PHASE III PROTOTYPE SYSTEM DESIGN & DEMONSTRATION



OBJECTIVE:

Complete System Design Activities and Integrate all Required Components into a Functioning Prototype System. Demonstrate System Performance.

DELIVERABLES:

- 1 Prototype OICW System
- OICW Ammunition
 - ✓ 300 High Explosive (HE) Rounds
 - ✓ 600 Target Practice (TP) Rounds
 - ✓ Off-the-Shelf 5.56mm M855 Kinetic Energy (KE) Rounds
- Virtual Simulation Mock-Up System

* Contract Modifications Required for Additional Hardware Deliverables (Phases IV & V)

- GEN II ATD
- OICW ATD



SUMMARY



- **Credible Contractor Development Teams Involved
✓ IR&D Activities Continue**
- **IPPD Philosophy In Place**
 - **Contractors/Government/Users**
- **20mm Air Bursting Munitions Appear Feasible**
 - **Technical**
 - **Performance**
- **OICW Prototype System Will be Demonstrated in FY97**
 - **Live Fire Field Experiment: FY98-99**
- **OICW Mock-Ups and Information Papers Available in
JSSAP ADPA Booth**



POINTS OF CONTACT



GOVERNMENT:

Jim Ackley, Chief JSSAP

Vern Shisler, OICW ATD Manager

Matt Zimmerman, Deputy OICW ATD Manager

Steve Mango, Alliant Techsystems IPT Lead

Ralph Mazeski, AAI Corporation IPT Lead

PHONE:

(201) 724-7913

(201) 724-6009

(201) 724-7993

(201) 724-7944

(201) 724-6936

CONTRACTORS:

Paul Shipley, AAI Program Manager

Mike Moore, Alliant Program Manager

(410) 628-3462

(612) 931-4090

Key Phase II **Technical Factors Needed**

- “Assured lethality”
- System weight
 - Confirm baseline weight
 - Roadmap to maturity
 - P3I plans
- Fire Control System
 - Aimpoint approach
- Aimpoint approach acceptance
- Laser range finder function
- Critical demonstration success
- Recoil mitigation verification
- Production plan
- System analysis

Overall Program Concerns

OICW

- Concern about “assured lethality”
 - Warhead type
- Concern about effective ranging
 - Laser range
- Concept application in combat environment
 - MANPRINT
- Affordability

T15020_1066

Contraves—Heckler & Koch—Dynamit Nobel

Alliant Techsystems Proprietary

ALLIANTTECHSYSTEMS

Draft

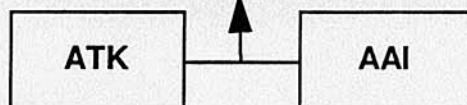
OICW Downselect Process

T. Bierman

Reference - ATD Approval 12/94

LEVEL 1

Independent Evaluations *



LEVEL 2



Players

S. Mango - Sys	R. Mazeski - Sys
K. Bauer - WPN	P. Baker - WPN
M. Desanti - Fuze	D. Ward - Fuze
D. Barnhart - Sys Anal	D. Barnhart - ?
J. Edwards - FCS	J. Edwards - Gen II
O. Hrycak - Prod	O. Hrycak - ?
L. Marshall - NV	L. Marshall - FCS
D. Ahmad - AMMO	
B. Spine - H.F.	

W. Haddigan -
S. Mango -
MAJ. M. Monahan -
MAJ. C. Schiffer -
V. Shisler -
M. Zimmerman -
MAJ. S. Harris -
G. Solham -
D. Haywood -

Responsibility

- Evaluating Test Results
- Scoring
- Recommendation

- Review Technical
- Decision Makers
- Modify and Influence
- Management & Cost

V. Shisler	- ARDEC (JSSAP)
C. Spinelli	- ARDEC (TECH)
M.G. L. Lehowkicz	- TRADOC
M.G. T. Prather	- AMC
C. Singley	- SARDA
D. Vaughn	- USMC
COL A. Canada	- Battle Lab (Ft. Benning)
COL B. Patterson	- Combat Dev. (Ft. Benning)

DCSOPS

MAJ. Mount
M.G. Riggs
GEN. Anderson
L.G. Blackwell

SARD

MAJ. Armor
COL. Yerkes
B.G. Caldwell
M.G. Van Prooyen
L.G. Hite

TRADOC

GEN. Hartzog
GEN. Cravens
COL. Volz
Herm Schmidt

OSD

Walt Squires
Pete O'Neill
Andy Villu
George Kopczak
Dr. G. Schneller

LEVEL 3



Col. Ely	- Chairman
J. Ackley	- Assistant
Col. G. Dockendorf	- USMC
T. Rinadi	- USN
Col. S. Shoemaker	- USAF
Capt. ? Gross (?)	- CC
T. Gannon	- SO
Col. B. Patterson	- USA

Players

Responsibility

- Approval
- Challenge
- Veto Power

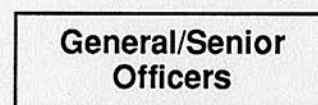
LEVEL 4



Gen. Boddie	- SSA
B. Bushy	-
J. Gehbauer	-
Col. J. Johnson	-
V. Linder	-
C. Spinelli	-
B. Traefilietti	-
C. Johnson	-

- Acknowledgement
- Bless off
- Mgmt. Block Check
- Minor Funding

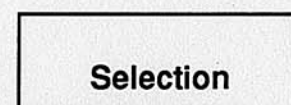
LEVEL 4.5



- TACOM
- AMC
- OSD
- SARDA
- DCSOPS
- TRADOC
- NATICK
- Battle Lab

- Protocol
- Acknowledgement
- Funding Sources

LEVEL 5



F. Milton	- SARD
B. Reisman	-

- ATD Responsibility
- Final Approval
- Funding Source

Independent Evaluation

Potential independent evaluation team leaders who have not been directly involved in program but understand objective, etc.

Actions

1. Add—other candidates
2. Identify who will be evaluators
3. Pre-brief where possible

System	Weapon	Fire Control	Ammo	Fuze
<ul style="list-style-type: none"> • G. Solhan • Dan Haywood 	<ul style="list-style-type: none"> • Kent Johnson • Mike Goes • George Newenhouse (involved in ACR and JSSAP activities) 	<ul style="list-style-type: none"> • Fire Control Lead at ARDEC 	<ul style="list-style-type: none"> • Trefilletti • D. Conway • W. Godomski 	<ul style="list-style-type: none"> • M. Derrig • Goodman • Al Nash • George Extein



Win Strategy

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Win Strategy Summary

OICW

- ☐ **Execute The Contract:**
- ☐ **Provide A Vision And Path To The Tactical Weapon**
- ☐ **Make Them Want Our Team**

Contraves — Heckler & Koch — Dynamit Nobel —

Alliant Techsystems Competition Restricted

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Win Strategy Summary

OICW

□ **Execute The Contract:**

- Successfully Perform 14 Critical Demos On Schedule
- Show Design meets ATD exit Criteria and Performance Spec
- Submit a competitive Phase 3
- Submit UPC that meets/exceeds exit criteria
- Conduct Winning Final Review
- Define Producibility and Production Plans

Win Strategy Summary

OICW

□ **Provide A Vision And Path To The Tactical Weapon**

- Streamlined Side-by-Side Model
- Credible Weight Reduction Roadmap
- Credible Design Evolution Roadmap
- Simple, User-Friendly Fire Control
- Confidence in Assured Lethality

Contraves — Heckler & Koch — Dynamit Nobel

Alliant Techsystems Competition Restricted

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Win Strategy Summary

OICW

□ **Make Them Want Our Team**

- Aggressively embrace the Integrated Product Team Philosophy
- Promote flexibility and willingness to listen to the customer
- Evolve the weapon concept based on customer comments
- Promote the extensive background (confidence) in ATK team
- Encourage personal contact/relations with engineer/Government counterpart
- Provide timely response to customer requests
- Promote team investment (match)
- Provide leadership to JSSAP initiative to carry two teams into Phase 3



Issues

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- **Ability and Prioritization Of All Companies To Successfully Complete Remaining 14 Demo's**
- **Commitment To Competitive Phase 3 Price Vs. Current Option Bid Vs. Projected Cost**
- **Production Planning, HK's U.S. Capability and U.P.C.'s**
- **Funding For Phase 3 Multiple Contractors**
- **Our Weapon is Longer, Bigger Than Competitors**

Summary of Key Actions

OICW

- **Program Review 4 (Plans, Implementation and Execution of Contractual Data)**
- **Phase 3 Plan and U.P.C.'s Update**
- **Guide and Support JSSAP's Multiple Contract Funding Effort**
- **Visionary Model and Path To Achieve**
- **Assured Lethality In 20mm Configuration - Keep the Program Sold**
- **Completion of Video**
- **Sufficient Internal Funding**
- **Resolve HK Proprietary Data**

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OICW Issue/User Support

Condition

- Current (12/94) ATD plan requires industry downselect to one contractor at completion of Phase 2, component testing — February 1996

Issue

- Industry believes downselect to be premature, based only on components and paper projections
- Downselect should occur at completion of Phase 3, weapon prototype delivery — February 1997

Factors

- Cost to retain both teams is less than \$5 million, spread over 2 fiscal years
- House and Senate authorization favor plus-up or Army reprogramming action
- Industry required in Phase 3 to furnish all-up weapon and ammunition for testing/prove-out firings

Benefits

- Industry teams have different technology approaches
- Substantially increases creditability of decision-making; better user test data assessment
- Importance of OICW to success of 21st Century Land Warrior
- Technologies have significant spin off potential for other applications

User Action

- Support the JSSAP initiative to update the ATD and allocate funding for OICW downselect only after completion of Phase 3

OICW Multiple Contractor Phase 3 Funding Status

OICW

- **ATK Briefings, Marketing, Congressional Relations, Krosser Guiding/Supporting Initiative**
- **JSSAP Management Committee, OSD, SARD, DCSOPS, USMC, TRADOC, ARDEC Endorsed The Concept - (Delay Downselect)**
- **Dec. '95 Congressional Authorizers Joint Committee Encourages Multi Contractors in Phase 3**
 - **Supports FY96 Reprogram Action**
 - **Supports FY97 Increase in Funding**
- **Gen McCaffrey (U.S. Southern Command) Requested Support From Gil Decker and Gen Hartzog (TRADOC) Dec. 95**
- **JSSAP Briefed Gen Riggs (DCSOPS) in Dec. - Supports Concept**
- **JSSAP Planning a Gen Hite (SARD - \$'s) Briefing Week of 22 January**
- **JSSAP White Paper Submitted To (SARD) 18 December Outlining Funding Profile Alternatives**
- **Gen Riggs Has Advised Gen McCaffrey of His Support For Multi Contractors (4 January Pentagon Visit)**

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JSSAP OICW Phase 3 Funding Alternatives

OICW

- **White Paper Forward To SARD (Major Armor)**
18 December 1995

Priority A - Fund Both Contractors

FY96	@	\$3.5 Mil
FY97	@	\$4.5 Mil

Priority B - FY96 Slowdown/Stretch Out Into FY97

FY96	@	\$1.5 Mil
FY97	@	\$6.5 Mil

Priority C - Restructure Phase 3 and Continue Both in FY97 and FY98

FY96	@	\$0 (Use Existing Funds Only)
FY97	@	\$5.0 Mil
FY98	@	\$3.0 Mil

- **Benefits**
 - **Maximize user Satisfaction**
 - **Exploit Diverse and Complimentary Technologies**
 - **Minimizes Program Risk Between ATD - EMD**

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Key Themes Promoting ATK Over AAI

OICW

Guaranteed Phase 3 success because of proven, low risk approach - Meet or exceed all ATD exit criteria

Developer is the producer

Extensive Experience Developing and Fielding Weapons

Responsiveness through evolution

Technological Discriminators:

Accurate, miniature turncount fuzing

Controlled Fragmentation

Recoil Mitigation (Floating barrel-hydraulic buffer)

UIR

Weapon Feed Mechanism

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Executive Messages

- Strong technical and production team
- HK will have U.S. production facility
- OICW program is under funded
- JSSAP conducting program better than in the past
 - User participation very high
 - Utilizing systems approach
 - Product results focused
- Dedication to integrated (government/industry) product teams is beneficial
- Phase 2 downselect is:
 - a) premature
 - b) limits innovation
 - c) too subjective

- ☐ **Demonstrate clear cut technical superiority over AAI**
 - Perform successfully on critical demos
 - Weapon system must meet all ATD exit criteria and spec requirements

- ☐ **Overcome customer negative concerns with concept**
 - Customer must like look, feel, handling of concept
 - Must specifically address system feature dislikes

- ☐ **Push for downselection after Phase 3**

- ☐ **Must make customer "want" our team**

Basis For Downselect—Phase 2

- Not required to go with lowest price
- Technical results to be 4 X (although detail Phase 2 exit criteria not formalized)
- Management to be X
- Cost evaluated but not scored
- Cost will be adjusted for realism
- Bottom line
 - Subsystem demo results are critical
 - User teams to have key input
 - Flexibility to go best value

Acquisition Planning

- Establish two separate government-industry teams
- ATD plan requires Integrated Program Process Development and Concurrent Engineering
- Downselect after Phase 2 (February 1996); 2 to 1 contractor
- Retaining two contractors through Phase 3 requires \$3–5M plus up
- G. Singley's alternative guidance
 - After Phase 2, if inadequate progress, resolicit
 - or
 - Consider best technology using mix/match team members
- JSSAP strategy is not to tie OICW solely to GEN II/21st CLW, but also as stand-alone program
- Encourage ammunition/fire control commonality with Crew Served Weapon

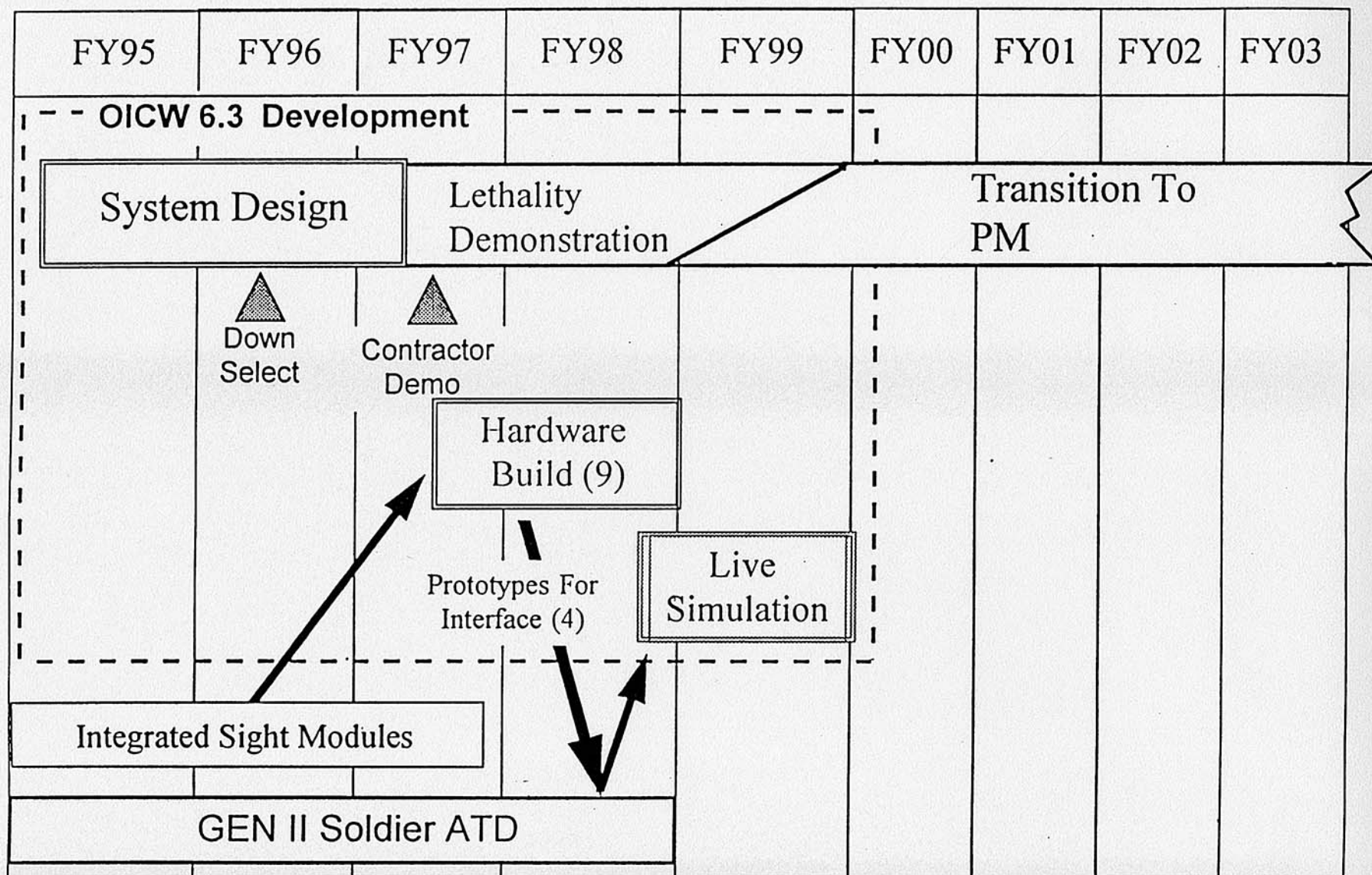
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OICW ATD Acquisition Roadmap



OICW Estimated Funding Profile (\$ M)

FY95	96	97	98	99	00-05	06-10
\$7.8	4.4	3.1	4.6	3.6	25.0	232.0

Advanced
Development

Engineering &
Manufacturing
Development

Procurement

OICW ATD Milestones:

	Date
1. Phase I: System Conceptualization Complete	Dec 94
2. Contract Down Selection	Jan 95
3. Phase II: Critical Subsystem Component Design & Demo	Jan 96
4. Contract Down Selection	Feb 96
5. Phase III: Prototype System Design, Build, and Demonstration	Feb 97
6. Phase IV: OICW Final Design & Hardware Build	Feb 97–Oct 98
7. 21CLW Field/Virtual Simulations	Jan 98–Sep 98
8. OICW System Safety Tests	Jan 98–Sep 98
9. Phase V: OICW ATD/DBE Field/Live Simulations & Analysis	Oct 98–Sep 99

OICW ATD Deliverables

- Contract: 1 prototype OICW system/ammunition
- Contract Option: 6 prototype OICW systems/ammunition for OICW ATD/DBE
- Contract Options: 3 prototype OICW systems for GEN II ATD

Market Potential

Quantities

Cost Bogies

Program Potential

• 45,000 systems (rifle/fire control)		\$6–10K	\$270+M
• 20mm HE tactical	} 10–20 Million (Yrs. 2003–2012)	\$25–30	\$250+M
• 20mm HE training		\$5–6	\$50+M
			<hr/>
			Total \$570+M
Revenue from spin off into other calibers			\$+++M

Cost of Current Products

• M16	\$650	} \$20K
• ANPVS4	\$4,650	
• TWS	New	
• 40mm ammo (M433)	\$14.00	
• 25mm (M792)	\$20–25.00	

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OICW Team Structure

Role	AAI	Alliant Techsystems
Integration	AAI	Alliant
Gun	AAI plus FNMI (production)	H&K
KE Ammo	— (using M16 variant, FN produces M16)	DNAG support
HE Ammo	AAI plus Olin (production)	Alliant
Fire Control	Hughes	Contraves
Warhead	Dyna East	Alliant
MANPRINT	Hilton Systems Mason & Hanger (?)*	

*Role unclear now with Olin added, may be deleted

Contract Profiles

OICW

	Phase 2 Award	Phase 3 Option
AAI	\$3,524,380	\$3,771,380
ATK	\$3,205,360	\$3,563,137

Reference (Feb. 1994)

<u>AAI-Original Bid</u>	<u>Olin-Original Bid</u>	<u>ATK-Original Bid</u>
Ø2 = \$3,747,000	Ø2 = \$3,139,000	Ø2 = \$4,964,000
Ø3 = \$4,769,000	Ø3 = \$3,150,000	Ø3 = \$4,484,000

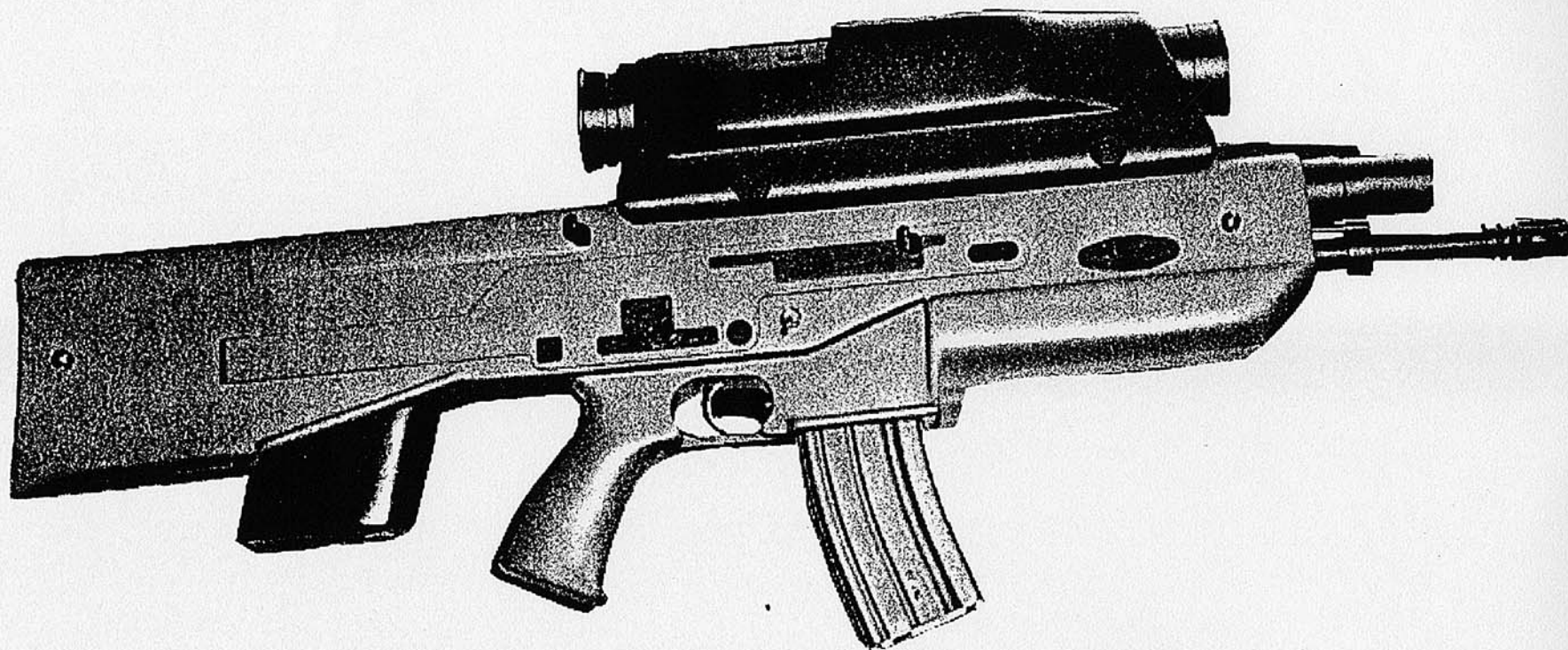
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AAI System Description



OICW Competitive Assessment – Technical Baseline

	Contractor	
	Alliant Techsystems	AAI
System Parameters	Side x side	Over/under
Caliber		
HE	20mm	20mm
KE	5.56mm	5.56mm
Weapon Type	Conventional	Bullpup
Range (HE)	1000	1000
Weight (Est) (lbs)	10-12	10-12
Fuze	Turn count	
Warhead	Pearson notch or innovative	Some form of innovation
Propulsion	Conventional single chamber	Consolidated/caseless (likely)
Fire Control	Fixed, dual aimpoint for Phase III (option for single aimpoint)	Electronic, single aimpoint

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AAI System Description

- Weapon: bullpup
 - Feed: KE: forward
HE: rear
 - Recoil mechanism: coaxial (likely)
 - Weight: 10–12 pounds
 - KE ammo: 5.56mm
 - HE ammo
 - 20mm
 - Cartridge case: none
 - Propulsion: likely some form of caseless/consolidated
 - Ejected components: likely none
 - Projectile
 - Likely innovative mid-fuze
 - Controlled fragmentation
- } Customer comments “Fragmentation pattern needs some work”
- Fuze
 - Uncertain of specifics
 - May be time based with some form of compensation
 - Some indication that turns based may be used
 - Set by multiple means
 - Fire control
 - Aimpoint — single
 - Electronics — likely primary
 - Optics — backup
 - Range finder — single pulse (??)

AAI System Description

Miscellaneous Comments

OICW

- Weapon
 - Ergonomics well defined and focused to MANPRINT
 - Over-under design “can’t see both barrels”
 - Customer not sure if it will work → “optimistic”
- Ammunition: may have some unique features
 - Rocket/spin booster
 - Semi-cased telescoped
 - Some variant of hi-lo system
 - Feed propulsion and projectiled separately
- Fuze
 - “Does Alliant Techsystems fuze radiate?” → implies the other fuze may not have battery
 - Charging may be by direct contact
- Fire control
 - May use Acoustic PDQ System in some way
 - Likely has some way to update for second, third round

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Competitive Assessment

	Alliant Team	AAI
Strength	<ul style="list-style-type: none"> • Strongest potential overall technical team • Gun, Ammo, FC technical resource • Experience • Concurrent engineering/manufacturing • Management team with development to production history 	<ul style="list-style-type: none"> • Innovative • Strong sub with Hughes • Competitive price • Cost structure based on value added/systems concept
Weakness	<ul style="list-style-type: none"> • Model • MANPRINT • Weight confirmation 	<ul style="list-style-type: none"> • No long term program history – Ammo • Track record with customer • Concurrent engineering/manufacturing image • Image caused addition of FN and Olin (now a plus)
Why Customer Wants This Team	<ul style="list-style-type: none"> • Long term commitment • IPT success • Team strength • Incorporating ideas of user/developer via IPTs • Transition capability • Confidence in successful Phase III 	<ul style="list-style-type: none"> • Innovation • Demonstrated performance • Vision of success

AAI Pluses/Minuses

OICW

Pluses

- Weapon design appearance
- Apparent acceptance by customer
- Team with all needed program capability (see minus comment)
- Viewed as responsive
- Uses Small Arms Industrial Base e.g., FN
- Early acceptance of Fire Control
- Early focus on testing and data
- Emphasis on systems performance and tracking performance (i.e., system analysis)
- Effective use of model with troops

Minuses

- Risky design
- No success track record
- Complex team structure requiring transition of responsibility
- Underlying concern about can they achieve what they say
- Few recognized "experts" on AAI program organization

Areas to Exploit

- Bullpup safety
- Ammunition risk
- Unproven mechanism
- Fire control complexity (???)



Need to confirm before using

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AAI Key Concerns

OICW

- Image of not being development to production contractor
 - No history of successful transition
 - Forced addition of FN and Olin—due to image—but now an effective team
 - Team Management may be complex
- Image of innovative designs which may be high risk and low confidence/success
 - Will be forced to move to more conservative approach
- Increasing uneasiness by Government regarding AAI
 - No specifics but visible concern
- No visible design changes to weapon in Phase II
 - May hide facts or represent that they have a problem

Primary

- Turns count fuze → precision
- Weapon mechanism → applying proven technology
- Recoil mitigation → based on proven concepts
- UIR → low weight/low power thermal capability
→ modularity → excellent detection
- Full service contractors—development to production



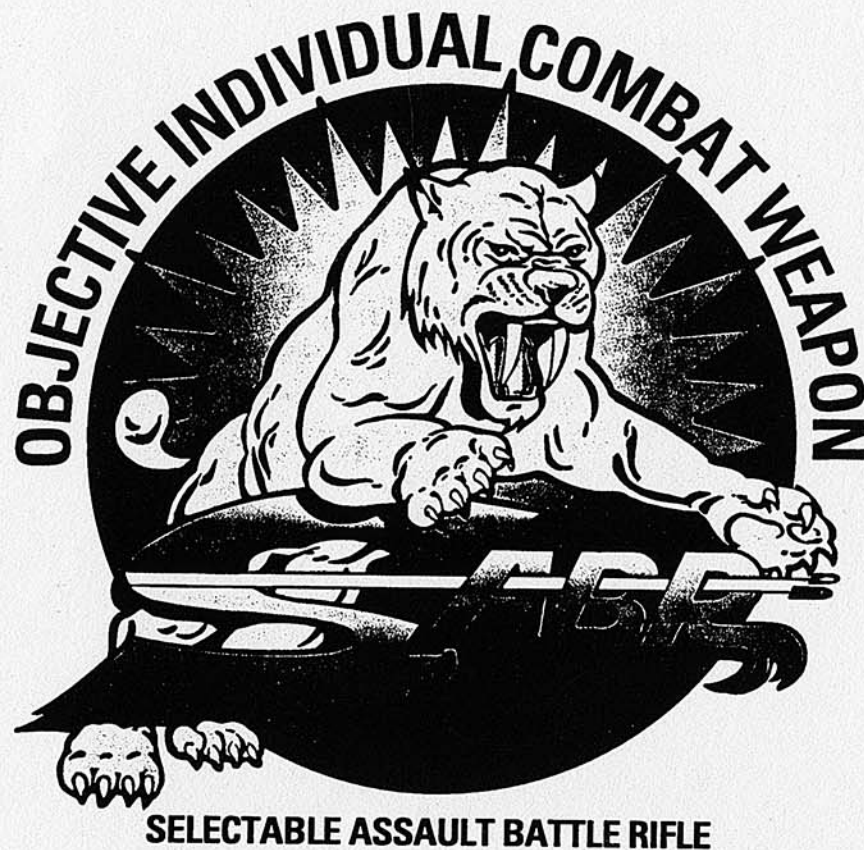
Assures ATD
success

Pluses

- Commonality (Fire Control, Ammunition Components)
- Growth potential
- P3I

Pre-Program Critical Technologies

<u>Technology</u>	<u>Status</u>
<ul style="list-style-type: none">• Recoil mitigation• Fuze miniaturization• Lightweight composite material applications• Bursting munition effectiveness• Laser range finder	<ul style="list-style-type: none">• Critical demo database must show benefits• Design, 3-D CAD confirm• Must have confirming data• Applied in design• Need to have positive visibility• Analysis (theoretical) says 20mm can meet objectives• 20mm database may not support objectives• Must show benefits and emphasize innovative warhead, etc.• Technology evolving, 1 meter demos• No hard confirming database• Critical demo will add some data• Phase III is key



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HK

contraves

Dynamit Nobel